DOCUMENT RESUME

ED 060 075 TM 001 225

TITLE	Casing Tier 529.887-020; Sausage Packer; Skin Peeler 525.884-050; Sliced-Bacon Packer II; Packer 920.887-114 -- Technical Report on Standardization of the General Aptitude Test Battery.
INSTITUTION	Manpower Administration (DOL), Washington, D.C. U.S. Training and Employment Service.
REPORT NO	TR-S-35
PUB DATE	May 51
NOTE	8p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Aptitude Tests; *Cutting Scores; Evaluation Criteria; *Food Processing Occupations; Job Applicants; *Job Skills; Norms; Occupational Guidance; *Personnel Evaluation; Test Reliability; Test Validity
IDENTIFIERS	Casing Tier; GATB; *General Aptitude Test Battery; Packer; Sausage Packer; Skin Peeler; Sliced Bacon Packer

ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is included. (AG)

ED 060075

TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

529.887-020 CASING TIER
525.884-030 SAUSAGE PACKER
SKIN PEELER
SLICED-BACON PACKER II
920.887-114 PACKER

S-35

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TM 001 225

Prepared by
Texas Employment Commission

Published by
U. S. DEPARTMENT OF LABOR

Washington , D. C.
May 1951

GATB #620
2-51

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY FOR

CASING TIER 8-09.11
SAUSAGE PACKER 8-09.11
SKIN PEELER 8-09.11
SLICED-BACON PACKER II 8-09.11
PACKER 8-04.10

S-35

Summary

The GATB was administered to 50 workers employed at the George A. Hormel & Company, Dallas, Texas. The criterion consisted of the combined ratings of three plant supervisors. The significant aptitudes for these jobs were found to be Aiming, Motor Speed, Finger Dexterity, and Manual Dexterity.

Norms

The GATB norms for occupations of Casing Tier, Sausage Packer, Skin Peeler, Sliced-Bacon Packer II, and Tamale Packer consist of Aptitudes A, T, F, and M. Applicants must meet the critical scores on all aptitudes to be referred as test selected for these occupations. Table I shows the test norms with the acceptable scores for each aptitude.

TABLE I

Minimum Acceptable Aptitude Scores for B-1001

Aptitude	Tests	Minimum Acceptable Aptitude Score (Total of Converted Test Scores)
A	CB-1-C CB-1-K	85
T	CB-1-G CB-1-K	85
F	CB-1-O CB-1-P	85
M	CB-1-M CB-1-N	85

TECHNICAL REPORT

I. Problem

The study was conducted to determine the best combination of aptitudes and minimum scores for norms on the GATB for the occupations of Casing Tier, Sausage Packer, Skin Peeler, Sliced-Bacon Packer II, and Tamale Packer.

II. Sample

The sample consisted of 50 employed workers at the George A. Hormel & Company, Dallas, Texas. These workers were employed in various jobs in the Hormel plant, and were interchanged among these jobs. Management stated that a worker could perform any of the operations of any job. The training time was 30 days for each job. The workers were selected based on an interview. No tests were used for selection purposes.

Table II shows the Means (M), Standard Deviations (σ), Range, Pearson Product-Moment Correlations Corrected for Broad Categories with the Criterion (c^r), and Standard Errors of Correlation ($\sigma_{c}r$) of Age, Education, and Experience for this sample.

TABLE II

Means (M), Standard Deviations (σ), Range, Correlations (c^r), and Standard Errors of Correlations ($\sigma_{c}r$) of Age, Education, and Experience

N = 50

	M	σ	Range	c^r	$\sigma_{c}r$
Age (mos.)	343.5	80.5	241-597	-.080	.141
Education (mos.)	81.5	18.6	45-108	.173	.137
Experience (mos.)	14.7	17.7	1-59	-.028	.141

There appears to be no significant relationship between the criterion and age, education, or experience.

III. Job Descriptions

Casing Tier 8-09.11

Job Summary: Performs various operations in sausage preparation, such as gathering casing on spout of stuffing machine, tying ends of sausage casing, and cutting off excess string with knife.

Work Performed:

1. Gathers casing, ties and cuts string: Picks up empty casing and gathers it on spout of stuffing machine to allow compressed air to force sausage meat into casing. Receives open end of filled casing from Stuffing Machine Operator, twists open end of casing tightly about sausage; quickly ties twisted end of casing with string, making a loop to be used later in hanging sausage from racks; cuts off excess string with knife. Pushes filled and tied casing toward end of moistened table for hanging from rack. May hang filled casings on rack for subsequent handling.

2. Assists in preparing linked sausages: Ties together two ends of stuffed casings to make a longer string of linked sausages. May hang linked sausages on rack for further handling.

Sausage Packer 8-09.11
~~Skin Peeler 8-09.11~~

Job Summary: Skins, weighs, wraps and packs linked wieners.

Work Performed

~~1. Prepares wieners: Changes skin wieners to skinless wieners by cutting the end off of each link with knife and stripping casing from wiener. Places skinned wiener in box on table and casing in waste can. Repeats skinning process rapidly, being careful not to mar links as they are cut from the string. Places marred links in separate box for rework.~~

2. Weighs and wraps wieners: Selects specified amount of peeled wieners from box and places on scale; observes pointer on scale and changes wieners as necessary to make balance pointer indicate an exact pound. Removes weighed wieners and places on table near wrapper. Wraps wieners by placing each weighed bunch on prepared wrapper in special holding device that forms the loose wieners into a compact package. Folds ends of wrapper over and presses ends against a hot plate that seals the package. Repeats sealing process on other end and places sealed package on nearby table. Places packaged wieners in shipping carton, counting the specified number for each carton; seals carton with gummed paper tape and places filled carton on nearby rack for pickup.

Sliced-Bacon Packer II 8-09.11

Job Summary: Working with others as a team, packs, weighs and wraps sliced bacon into specified units and packs into cartons.

Work Performed

1. Apportions bacon slices: Removes approximately one pound, or half pound, of bacon from conveyor as it comes from slicing machine, using a wide paddle to slip under bacon, using judgment as to how many slices will weigh the specified amount. Lifts sliced bacon carefully to prevent disturbing

the evenness of pattern and places bacon on wrapper that has been previously positioned by a coworker. Shoves each portion of bacon onto conveyor where it is carried to weigher. Removes scraps from ends of each slab and places in nearby box, and places extra slices on conveyor for use by weigher.

2. Weighs and wraps bacon: Removes apportionment of bacon from conveyor, one at a time, and places on Over-under Scales; observes pointer which indicates over or under weight of unit. Removes or adds bacon slices or cuts slices into smaller pieces to make each unit weigh the exact amount. Folds wrapper over weighed bacon and presses down firmly. Places wrapped bacon on conveyor to be carried to Carton Packer. May stack unweighed unit on work table for weighing later when unable to keep up with flow of units on conveyor. Weighs and wraps reserve units as time permits.

3. Packs bacon in cartons: Assembles cardboard carton on work table and inserts wrapped bacon, being careful to count the specified number of units for each carton. Seals each carton by folding lids and applying gummed paper to edges of lid. Places sealed carton on nearby table for pickup by others.

4. Wraps bacon ends: Weighs bacon ends and scraps into pound units, using special scale and wraps by hand, in special wrapper. Seals each package by pressing edges of wrapper against hot plate momentarily which causes the paper to adhere together. Packs twelve units in shipping carton and seals with gummed paper.

Packer (Can. & Preserv.) 8-04.10

Job Summary: Counts and places tamales in cans and performs related duties.

Work Performed

1. Packs tamales: Picks up tamales rapidly with both hands until desired total is ready; inserts tamales in empty can by grouping tamales from both hands into one unit and squeezing one end slightly to allow the tamales to slide into can. Places filled can on Conveyor and repeats process.

2. Performs related duties: Sorts overflow of tamales at end of conveyor and packs acceptable ones in cans and places rejects on table for rework. Squeezes tamale contents from husks of rejects onto table; removes contents from table to vat for rework by others and places empty husks in waste can.

III. Experimental Battery

All the tests in the General Aptitude Test Battery, except Part E, were administered to the sample group.

IV. Criterion

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The criterion was based on independent ratings by the industrial relations director, superintendent, and foremen of the plant. The basis for the ratings was a combination of time studies and a comparison of the workers by observing them on the job. There was complete agreement between the three raters. The criterion was in broad categories, and the qualitative ratings were converted to linear scores for correlational purposes. In the sample of 50, there were

V. Statistical and Qualitative Analysis

Table III shows the Means (M), Standard Deviations (σ), Standardized Means (M'), and Standardized Standard Deviations (σ'), Pearson Product-Moment Correlations Corrected for Broad Categories with the Criterion (c^r), and Standard Errors of Correlations ($\sigma_c r$) for each test in the GATB. Also included are the Means (M') Standard Deviations (σ'), Pearson Product-Moment Correlations Corrected for Broad Categories with the Criterion ($_c r$), and Standard Errors for the Correlations ($\sigma_c r$) for the aptitudes measured for the GATB. The standardized means and standardized standard deviations are comparable with general population norms with the mean of 100 and a standard deviation of 20.

TABLE III

Means (M), Standard Deviations (σ), Standardized Means (M'), and Standard Deviations (σ'), Correlations ($_c r$), and Standard Errors of Correlations ($\sigma_c r$) for Each Test of the GATB by Aptitude, and Means (M'), Standard Deviations (σ'), Correlations ($_c r$), and the Standard Errors of Correlations ($\sigma_c r$) for Aptitudes of the GATB.

N = 50

Aptitudes	Tests	M	σ	M'	σ'	c^r	$\sigma_c r$
G				86.980	15.120	.136	.139
	H	15.640	4.807	95	14	.033	.141
	I	6.740	2.985	88	17	.075	.141
	J	14.380	6.480	86	14	.223	.134
V				85.900	14.057	.219	.135
	J	14.380	6.480	86	14	.223	.134
N				84.600	18.463	.056	.141
	D	20.900	7.624	85	20	-.025	.141
	I	6.740	2.985	88	17	.075	.141
S				93.760	14.058	.078	.141
	F	18.560	6.797	90	17	.269	.131
	H	15.640	4.807	95	14	.033	.141
P				91.260	23.329	.272	.131
	A	18.880	6.872	92	24	.266	.131
	L	23.020	7.501	92	19	.192	.136
Q				85.520	18.729	.118	.139
	B	56.520	13.729	85	19	.118	.139

Aptitudes	Tests	M	σ	M'	σ'	c^r	$\sigma_c r$
A				98.760	19.283	.276	.131
	C	46.620	8.235	107	22	.248	.133
	K	64.780	7.420	87	15	.423	.116
T				90.660	14.625	.384	.121
	G	131.260	17.450	96	17	.220	.135
	K	64.780	7.420	87	15	.423	.116
F				96.280	19.363	.516	.104
	O	26.760	4.345	96	19	.420	.116
	P	28.460	3.976	97	22	.075	.141
M				102.920	17.238	.842	.041
	M	90.200	7.715	105	18	.681	.076
	N	101.260	8.786	100	20	.711	.070

On the basis of the correlations between the individual tests of the GATB and the criterion, Parts K, M, N, and O were significant with correlation coefficients that were at least twice their standard errors. K had a correlation of .423 and a standard error of .116, M had a correlation of .681 and a standard error of .076, N had a correlation of .711 and a standard error of .070, and O had a correlation of .420 and a standard error of .116.

On the basis of the correlations between the aptitude scores and the criterion, five aptitudes P, A, T, F, and M were found significant. Correlations for Aptitudes P and A are twice their standard errors. Aptitudes T, F, and M have correlations that are at least three times their standard errors. T has a correlation of .384 and a standard error of .121, F has a correlation of .516 with a standard error of .104, and M has a correlation of .842 with a standard error of .041.

Based on means and standard deviations, correlations, and relationship to the job, Aptitudes A, T, F, and M appeared significant. Aptitude M is the only aptitude having a standardized mean greater than that of the average of the general working population.

Since this group of jobs has significant aptitudes which coincide with those of OAP 20, which consists of Aptitudes A, T, F, and M, each with a critical score of 8 OAP 20 was used as test norms for these occupations. A fourfold table was set up using these norms and a criterion critical score of High (workers rated A and B) and Low (workers rated C), and the results are shown in Table IV.

TABLE IV

Efficiency of OAP 20 with Aptitudes A, T, F, and M and Critical Scores of 85, 85, 85, and 85 Respectively and Criterion Critical Score of High and Low for Sample of Selected Meat Packing Jobs

N = 50

		Test Battery		Total
		Fail	Pass	
CRITERION	High	12	25	37
	Low	12	1	13
Total		24	26	50

A tetrachoric correlation together with standard error were computed and found to be: $r_t = .87$; $\sigma_{r_t} = .24$. As an additional test of the significance of the relationship between the battery scores and the criterion scores, chi square was computed for the distribution shown in Table IV. Chi square was 11.523 with a p/2 less than .0005. This means that there are 5 chances in 10,000 that this degree of positive relationship occured by chance.

VI. Conclusion

1. The significant aptitudes in this study appear to be Aiming, Motor Speed, Finger Dexterity, and Manual Dexterity.

2. It is recommended that OAP 20, which consists of Aptitudes A, T, F, and M, each with a minimum score of 85, be used as test norms for the occupation involved in this study.